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(54) ENDOCARDIAL MAPPING SYSTEM

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(*) Notice:

This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

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(56) References Cited

U.S. PATENT DOCUMENTS

4,522,212	•	6/1985	Gelinas et al	128/642
4,649,924	*	3/1987	Taccardi	128/642
4,660,571	*	4/1987	Hess et al	128/642
4,699,147	•	10/1987	Chilson et al	600/374
4,911,174	*	3/1990	Pederson	128/695
4,922,912	*	5/1990	Watanabe	128/642
5,025,786	+	6/1991	Siegel	128/642
5,156,151	*	10/1992	Imran	128/642
5,297,549	*	3/1994	Beatty et al	128/642
5,311,866	*	5/1994	Kagan et al	128/642
5,411,025	*	5/1995	Webster, Jr	600/374
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FOREIGN PATENT DOCUMENTS

8302742 * 3/1984 (NL) 128/642

* cited by examiner

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(57) ABSTRACT

A system for mapping electrical activity of a patient's heart includes a set of electrodes spaced from the heart wall and a set of electrodes in contact with the heart wall. Voltage measurements from the electrodes are used to generate three-dimensional and two-dimensional maps of the electrical activity of the heart.

19 Claims, 8 Drawing Sheets

